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A Narrative Study of Mask Wearing Behavior based on A PPP Model

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***Abstract*—Mask wearing is an important public health measure to prevent a number of communicable diseases including COVID-19, but the public react differently to mask wearing guidelines. This paper established a triple-influence "PPP Model" that combines mask policies (policy), risk perceptions (perception) and risk-aversion preferences (preference), and conducted narrative analysis of mask wearing behaviors of the public in the United States, Germany, Brazil, India, Japan, and South Africa during COVID-19 pandemic. By comparing those factors influencing public mask wearing behavior among different countries, this paper provides a reference for cross-cultural research on public mask wearing behavior, and for policy makers to design and implement public health measures precisely and effectively in the face of public health emergencies**

Keywords—mask wearing; risk preference; health policy; risk perception; COVID-19 pandemic

I. INTRODUCTION

The sudden onset of the COVID-19 pandemic in the early 2020s threatened people's lives and health. During the three-year period, different countries have adopted different pandemic prevention policies and achieved different pandemic prevention results. From an epidemiological point of view, wearing masks is one of the public health measures to cut the chain of transmission of infectious diseases by controlling susceptible populations, and masks played an indispensable role in the prevention and control of the COVID-19 outbreak.

Based on the social determinants of health framework, this paper suggests that differences in mask wearing across countries may be related to a variety of social factors. Luojun Yang et al. summarize the socio-cultural determinants of mask wearing behavior globally in terms of mask-wearing social habits, institutional signals, and risk perceptions[1]. Yanjun Sun et al. find that in addition to the cultural context, government advice and mandates can also shape people's perceptions of masks and must be taken into account when designing epidemiological policies. In addition to the cultural context, Yanjun Sun et al. found that government advice and mandatory orders can also shape people's perceptions of masks, and that it is important to consider the influences on mask wearing when designing pandemic prevention policies[2]. On the basis of the above literature, this paper aims to construct an analytical model of mask-wearing among different countries, to study the possible influencing factors of mask-wearing, and to guide the choice of mask-wearing policies in different countries in the face of major public health events.

II. RESEARCH METHODOLOGY

This paper selects six cultural circles based on socio-cultural representation: Anglophone (Anglo), European Union, Latin America, South Asia, Chinese (Confucian Asia), and Africa, and within each cultural region, its largest or second-largest economy: United States, Germany, Brazil, India, Japan, and South Africa.

In reflecting the results, this paper chooses to use the data of mask wearing rate or supporting mask wearing rate to represent the public's mask wearing situation. Combining social and medical knowledge and literature, this paper initially summarizes three more intuitive factors that can influence mask wearing: health policy, risk perception and risk preference. Health policy refers to the initiatives, decrees, and regulations issued by national government agencies in response to COVID-19 pandemics; risk perception refers to people's subjective judgement of the likelihood of injuries, diseases, deaths, and other negative events, and determines how people will cope with these hazards[3]. Risk Preference refers to a decision maker's Risk Preference refers to the decision maker's psychological attitude towards risk.

In this paper, four types of information were obtained and analyses in a combination of official documents, news reports, relevant literature and personal interviews. (search limited to 2020.1-2022.12) (1) The Chinese database (China Knowledge) was searched with six countries and the keywords "mask/ mask wearing" or "public health measures" or "COVID-19 outbreak". The English-language repositories (PubMed, ResearchGate) were searched with the keywords "mask/ mask wearing" or "public health measures" or "COVID-19 pandemic" for each of the six countries, and "COVID-19 pandemic" for each of the six countries. The English literature library (PubMed, ResearchGate) was searched with six countries and the keywords "mask/ mask wearing" or "public health measures" or "COVID-19 pandemic" respectively, and the articles were screened by reading the titles and abstracts. (2) Search for the above keywords in Baidu/Google search engine and Twitter social media platforms. Sources included World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Robert Koch Institute (RKI), Germany,

Department of Health, India (DIH), Johns Hopkins University (JHU), USA, YouGov, Hofstede Insights

Considering that most of the study data are text-based and that health policies, risk perception, risk preferences and public mask wearing behavior have evolved over time in different countries, the study mainly adopts the narrative research method in qualitative research, i.e., a narrative of how the three aspects of health policies, risk perception, and risk preferences have affected public mask wearing behavior in the country.

III. FINDINGS

A. Narrative analysis of mask wear in six countries

1) Germany

a) Health policies: The outbreak of the COVID-19 disease began in Germany around 25 February 2020. 7 March, public activities involving crowds were not banned, and German officials maintained the attitude that "masks could not stop the spread of the disease" and did not advocate people to wear masks in public places. 22 March, the German federal government decided to implement the "Social Restriction Order" nationwide. 2 April, the German CDC agency Robert Koch Institute (RKI) changed its attitude towards wearing masks, agreeing with the idea of wearing masks. On 2 April, the Robert Koch Institute (RKI), Germany's disease control agency, changed its stance on wearing masks, agreeing that wearing masks as a precautionary measure can reduce the risk of spreading the virus to others, even if people don't show symptoms. On 22 April, the German federal government decided to implement a mandatory mask order for public places. by June, the first wave of the pandemic peak in Germany was largely over. from November, in response to the second wave of the pandemic peak, Germany entered a state of lockdown until March 2021. on 3 April 2022, Germany lifted the vast majority of the nationwide restrictions on neo-crowning outbreaks in a small number of settings only, such as clinics, nursing homes hospitals, and when travelling on buses and trains.

b) Risk perceptions: According to YouGov, the German population's fear of new coronaviruses is at a low level, which is inextricably linked to the efficiency and effectiveness of Germany's excellent quarantine, the efficiency of diagnosis and detection, the capacity for crisis management and surveillance, and the affordability of healthcare resources. Timo-Kolja Pförtner's study[4] shows that the German population's preventive behavior tends to increase and then to decline , with consistent and significant absolute and relative differences, with lower prevention behavior among people with low educational qualifications. In terms of risk perception, the values were consistently low for people with low education, while perceived effectiveness and trust declined significantly over time, but did not change significantly according to educational status. A survey by the Hamburg Center for Health Economics (HCHE) in early December 2022 indicated that inflation and high energy levels top the list of crises Germans are most worried about, with the Russian-Ukrainian conflict and climate change coming in second, and the COVID-19 only in fifth place.

c) Risk preferences: According to Hofstede's cultural dimensions' theory, Germany is more individualistic and manly (Masculinity), with a slight preference for uncertainty avoidance, and socially pragmatic and restrained (Restraint). In the past, ordinary people in Germany did not wear masks in their daily lives, and only patients and medical workers would need to wear masks, so Germans would feel strange or even resentful towards ordinary people wearing masks. In the early days of the COVID-19 pandemic, mask wearers similarly appeared out of place; people would think that mask wearers were overreacting, and the behavior itself alienated people. However, with the publication of research and the introduction of policies, the majority of the population "accepted this without complaint", and the number of mask wearers shifted from about one in five to eighty to ninety per cent, who began to believe that wearing a mask protects others, provides a sense of security, and symbolizes collective solidarity in the fight against the pandemic.

d) Summary: The German news portal t-online asked around 5,000 people between 14 and 17 March 2022 whether they would continue to wear masks in certain places after the lifting of the mandatory requirement to wear masks, and more than two thirds of Germans would like to continue to wear masks after the lifting of the "mask mandate". The HCHE survey conducted at the beginning of December 2022 shows that 63% of people support the continued wearing of masks on public transport, while only 17% oppose it. This shows that mask wearing in Germany has remained at a high level for a long time, initially because of strict public adherence to hygiene policies, and later because of the recognition of the benefits of wearing masks by Germans in terms of risk perception. Although Germans today are not very worried about new outbreaks from the point of view of risk perception, they are still willing to implement the previous policy of preventing outbreaks, and wearing masks in public is no exception.

2) United States of America

a) Health policies: In early February 2020, the earliest deaths were reported in the U.S. and the public began to rush to buy masks and other pandemic prevention supplies, resulting in a shortage of masks and other pandemic prevention supplies across the U.S. On February 4, the Centers for Disease Control and Prevention (CDC) issued a tweet indicating that the use of masks to protect against the pandemic was not recommended for the time being. On February 25, the CDC issued its first warning to the public to be prepared for an outbreak, and on February 29, the Surgeon General told the public to stop purchasing masks, arguing that masks do not provide effective protection for the general public, and that crowding out healthcare resources would pose an even greater hazard. On 3 April, the CDC began recommending that people wear cloth masks in "places where social distance cannot be maintained" and issued tweets promoting homemade cloth masks. The CDC did not recommend the use of N95 masks or medical surgical masks until November, when the CDC issued tweets stating that they should avoid the use of N95 or medical surgical masks,

and only on 12 February 2021 did it mention that it recommended the use of two-layer masks for better protection in a tweet. It was only on 12 February 2021 that the CDC mentioned "disposable masks" in a tweet recommending the use of two-layer masks for better protection. The second and third major outbreaks occurred during this time, and on 8 March, the CDC began to indicate that fully vaccinated people no longer needed to wear masks when meeting each other, and on 27 July, the U.S. reintroduced an indoor "mask order" and insisted on the wearing of masks in areas such as transportation and schools. Since then, the guidelines for masks have remained largely consistent, with vaccinated persons resuming most activities and going outdoors without masks, but wearing masks indoors in some high-risk areas, and unvaccinated persons continuing to wear masks until they are fully vaccinated.

b) Risk perceptions: According to YouGov, the public's fear of COVID-19 in the United States climbed rapidly after the outbreak and did not drop to low levels until April 2021, which is closely related to the high number of neocollin deaths in the United States. However, the public's fear of COVID-19 has not decelerated the spread of the outbreak, and the common people are facing more problems. On 12 March 2020, Congresswoman Porter said that the average person who cannot afford health insurance will have to spend $1,331 for a full set of COVID-19 tests in the U.S. and $4,000 a day for an isolation ward, and that about 30 million people in the U.S. cannot afford to buy any insurance, including health insurance. and 40 per cent of Americans can't come up with $400 for emergency expenses. As the pandemic continues to affect people's lives, Americans' perception of the risk of COVID-19s is diminishing, with a January 2022 poll conducted by the Kaiser Family Foundation showing that 75 per cent of U.S. respondents say they are tired of the COVID-19s pandemic, and more than 70 per cent believe infection is inevitable.

c) Risk preferences: The United States is one of the most individualistic countries in the world, combined with high levels of masculinity and lower than average levels of uncertainty avoidance, with a society that is indulgent and more concerned with short-term gain. In the United States, "even with the enormous damage caused by the pandemic, the requirement to wear masks met with enormous opposition at the time, with many believing that it went against American beliefs in freedom and individualism". In addition to this, in the past, Americans considered it impolite to talk while wearing a mask, and a number of states had enacted No Masking Laws. Therefore, getting the American public to wear masks on their own challenged many American traditions. It is worth noting that political leanings influence the American public's choices in the face of risk, with liberals being more inclined to use masks and maintain a social distance for self-protection compared to conservatives [6].

d) Summary: The CDC reported on 14 July 2020 that within days of the CDC's recommendation to wear cloth masks in April, 61.9% of people said they wore them while out and about; in May, the percentage of people wearing cloth masks rose to 76.4%. The Hill reported on 4 August that the poll showed 82% of registered voters in the US said they supported mandatory wearing of masks across the country, or covering their faces with items such as veils. Of those, 61 per cent "strongly" support the idea and 21 per cent "somewhat" support it. Only 18% oppose it.2022 On 20 April, the Associated Press-NORC Center for Public Affairs Research released a poll showing that 56% of Americans support requiring people to wear face masks when travelling on airplanes, trains and other public transportation, 24% oppose mask orders, and 20% say they neither support nor oppose them, but that there is a broad bipartisan divide: among Democrats 80 per cent support the mask order and only 5 per cent oppose it; among Republicans, 45 per cent oppose it and 33 per cent support it. For the United States, health policy played a positive role in urging the public to wear masks, traditional risk preferences were impacted, and it was the perceived risk of the COVID-19s that most influenced the public's wearing of masks; all three together resulted in a moderate level of public wearing of masks in the United States, with wide internal variations.

3) India

a) Health policies: The first case of SARS-CoV-2 was reported on 30 January 2020 in the Indian state of Kerala. There were three pandemic outbreaks up to November 2022. After 30 January, the Indian government went into a two-month hiatus before implementing policies such as a moratorium on international travel and contact tracing in early March. From 25 March onwards India entered a state of total lockdown across the country, stopping international tourists from entering and exiting the country, prohibiting residents from going outside, and shutting down public transport, among other things. The closure lasted 68 days from 25 March to 31 May 2020, and was partially lifted on 1 June 2020 due to economic pressures as new infections continued to rise on a daily basis. Between June and September, the closure was lifted in all regions, and some state governments have permitted interstate travel. The first outbreak ended in September. Health Minister Harsh Vardhan said at the end of January 2021, "India has managed to contain the outbreak." The government began to celebrate the victory against the pandemic and basic protective measures such as wearing masks were rarely practiced. The second wave began in March 2021, unlike the first because the central government was no longer unifying the blockade, this time States set their own policies and implemented them differently. Between March and April Indian elections took place in all states and anti-pandemic policies were weakened. For example, a two-day weekend closure was imposed in Delhi on 15 April. the second wave ended in June 2021. the third outbreak, in January 2022, was about as strict as the second. Indian police issue tickets for not wearing masks, with Delhi punishing more than 42,000 cases of not wearing masks or observing social distances between March and July. The city of Firozabad mandated that those who do not wear masks attend four hours of "social distance training" and handwrite "must wear mask" 500 times, while the city of Mumbai issued a circular on 8 April making it mandatory to wear masks and making it possible to arrest those who don't wear them under Section 188 of the Penal Code. The city of New Delhi imposed a fine of 500 rupees for not wearing

a mask from 25 April and deployed 88 volunteer teams to monitor the wearing of masks.

b) Risk perceptions: A May 2020 survey in peri-urban Tamil Nadu showed that the majority of people perceived their risk of contracting coronavirus to be low, with only 8.7 per cent and 7.6 per cent perceiving an intermediate or high risk of contracting the infection. The July 2020 survey in Maharashtra showed that only 19.7 per cent of respondents perceived that they were at a high risk of contracting the infection, with 9.38 per cent at an intermediate risk. The 2020 survey in rural Orissa showed 59 per cent of respondents felt they were not at risk of infection and only 13 per cent said they were. Overall, the perception of risk is low in the context of the high number of infections in India.

c) Summary: The Central Government's policy is capricious, with no absolute unity of leadership, and the Union also finds it difficult to implement the policies of its superiors, regardless of the situation at the grass-roots level in the implementation of a comprehensive embargo; instead, it struck at the economic base in the first nationwide embargo, resulting in insufficient financial support for the follow-up, leading to the poor implementation of the practical implementation of the grass-roots sector, and ultimately leading to the near-zero effectiveness of the pandemic's preventive and control measures, resulting in even more complex transmission. The lack of policy uniformity among Indian states, as well as the large gap between rich and poor and regional differences in India, are all factors that together have led to the current state of the pandemic in India.

4) South Africa

a) Health policies: On 5 March 2020, the first COVID-19 case was reported in the KwaZulu-Natal province of South Africa. As of November 2022, there have been five pandemic outbreaks. The President of South Africa declared a state of national disaster on 15 March, followed by the establishment of a National Command Council. The South African government attached importance to this window of prevention and control of the pandemic and quickly took strict measures to prevent the spread of the pandemic. a 35-day national blockade was imposed from 27 March, with measures such as keeping social distance, banning gatherings, and sealing the borders. The preventive and control measures had a huge impact on people's lives and the country's economy, and from 1 June, the level of the embargo was downgraded to level 3, and work and schooling began to resume in all areas. The overall trend of the pandemic then declined, as the economy was hit hard in the first half of the year and calls for relaxing the ban grew louder. the level was lowered to 1 on 20 September. a second wave of the pandemic began with the discovery of a more transmissible Beta variant strain in South Africa in October. the level of the embargo was adjusted from 1 to 3 on 28 December, and then downgraded back to 1 on or around 22 March 2021. the announcement of the 10 June 2021 Entered third wave of outbreak, strain was Delta variant, due to experience, government response was faster and more effective, upgraded to level 3 on 15 June, upgraded to level 4 on 28 June. downgraded to level 2 on 13 September, downgraded to level 1 on 1 October, end of third wave of outbreak. 9 November 2021 South Africa detected world's first omics jonquil strain, start of fourth wave of outbreak, 28 November Presidential speech announced that the level 1 closure level would remain unchanged, and on 30 December the government announced that it had passed the fourth peak of the pandemic and began to lift curfews and other measures. In early April 2022, the government announced that it was lifting the state of national disaster that had lasted for more than two years, and that it was easing all types of bans. At the end of April, a fifth wave of the pandemic broke out, with the main strains being BA.4 and BA.5. South Africa made it an offence not to wear a mask, but enforcement was poor. between 9 December 2020 and 1 February 2021, 10,701 people were arrested by the police for failing to wear masks in a variety of public places in KwaZulu-Natal province alone. From 1 February, not wearing a mask in public will be considered a criminal offence. By 22 March 2022, it will be possible to wear a mask in an outdoor public place without accompanying it.

b) Risk perceptions: A survey of sub-Saharan Africa with 21.7 per cent of South African data in April/May 2020 showed that the local population had a mean risk perception score of 22.4 (/30). In the second wave of the pandemic, about 50 per cent of the population thought they might be infected with the new coronavirus. In the fourth wave of the outbreak, 45.3 per cent of people in the City of Cape Town believed they were at high risk of contracting omicron and 60.3 per cent were highly concerned about omicron. Overall, about half of the people were concerned about the possible adverse effects of coronaviruses, with respondents fearing that they and their family members could be infected and believing that protective behaviors and behavioral restrictions were more important.

c) Summary: In a nationwide sample survey conducted between December 2020 and March 2021, self-rating of "wearing a mask in public" averaged 3.8 (range 1-4), with a very high rate of protective measures. In the second wave of the pandemic, the use of masks reached more than 70 per cent. Overall it was at a high level, but even though regulations made it mandatory to accompany masks, a large proportion of people still did not wear them. However, given South Africa's policy of penalizing people who do not too masks, respondents may have deliberately concealed their non-wearing of masks, and the actual wearing rate was not very high. Zhao Xiaoqiang (a pseudonym), a South African student, said that "whenever I go out, I see that locals rarely wear masks".

5) Brazil

a) Health policies: The attitude of the Brazilian central leadership towards the COVID-19 pandemic has been quite negative. The Brazilian government did not see it as a major event, but as an ordinary flu. The Bosonaro administration did not pay enough attention to it at first. President Bosonaro used to say that C.N.C. was just a "little cold" and that there was no need to make a fuss or to wear masks. He even argued that Brazilians had a strong immune system and could not get sick even if they swam in sewage sewers. The country's dramatic shift in attitude towards the COVID-19 Pneumonia pandemic began in mid-March 2020. Along with school closures,

numerous states affected by the outbreak banned non-essential business activities, such as São Paulo and Rio de Janeiro. The rest of the country followed suit with response initiatives. In lieu of strict controls at the central level, the central government decided to leave it to the state and municipal governments to tailor their responses to local conditions. Brazil initially did not impose strict closures and quarantines until May, when some cities gradually decided to impose quarantines, but not São Paulo and Rio de Janeiro, Brazil's largest cities. Being a country under long term colonial rule, Brazil's domestic industrial development is relatively backward, and it relies heavily on the export of raw materials in bulk for foreign exchange earnings in order to purchase industrial products. The president has been opposed to quarantine in order to reduce the economic impact of the logistical disruptions caused by the pandemic. An editorial in the prestigious medical journal The Lancet made it clear that the biggest threat to Brazil's response to the pandemic is President Bosonaro, who is "passively fighting the pandemic". The protests of 3 May 2020 were supported by none other than Bosonaro. He has been working to restart the economy and has opposed the blockade measures adopted by the states, an issue on which he was once pitted against São Paulo's governor, Doria. Meanwhile, some states are pursuing mandatory mask-wearing policies. In a study of Non-Pharmaceutical Intervention (NPI) in Brazilian states, it was shown that there are wide variations in NPI between Brazilian states at the state level. The lack of policy coherence between central and local levels, and between localities, has made the Brazilian fight against the pandemic a very torn process.

b) Risk perceptions: According to data from the YouGov website, the proportion of Brazilians who are afraid of contracting COVID-19 has fallen from a high of 80 per cent in mid- to late May 2020 to 56 per cent in mid-September. This shows that the perceived risk of COVID-19 is decreasing, but remains relatively high overall.

c) Risk preferences: According to Hofstede's cultural dimensions' theory, Brazilians are highly dependent on each other in society, and at the same time, they need to have nicer and relaxing moments in their daily lives, such as chatting with co-workers, enjoying a slow dinner, or dancing with guests and friends. Their enthusiasm and outgoingness in life and their need to enjoy life make them more inclined to follow social rules and regulations when faced with unknown risks. In the absence of government initiatives or legislation, they are more inclined to live with the risks in their old rhythm of life.

d) Summary: A study carried out in 133 urban areas in Brazil showed that a large percentage of the Brazilian urban population, essentially more than 90 per cent, wear masks in their daily lives. Even among those surveyed who did not believe that masks could prevent C.N.C.P., the rate of mask use was still close to 90 per cent. On the surface, the Brazilian urban population is very active in the use of masks, however, it is worth pointing out that around 50 per cent of respondents were not wearing masks at the time of the interviews, which is a reflection of the fact that the urban population's awareness of the need for greater prevention and self-protection actually needs to be increased. A survey conducted at the end of July 2020 showed that almost all participants (99.1 percent) reported wearing masks during the outbreak, yet 34.2 per cent wore them only because it was mandatory. Thus, rather than a higher level of risk aversion among the population, the impact of the implementation of state government policies recommending or making the wearing of masks mandatory is more likely. In general, the Brazilian population in urban areas performs better in terms of wearing masks. In practice, however, the importance that the population attaches to masks and the COVID-19 pandemic has not been matched by mask-wearing rates, and the high rates of mask-wearing among the population are due more to local government initiatives or decrees. At the same time, the adoption of a series of policies by central policy makers that led to the expansion of the pandemic and the conflict with the attitudes of local state governments towards pandemic prevention have led to the promotion of pandemic prevention policies that have long resembled remedial measures after the spread of the pandemic in Brazil. It is worth noting that, despite the lack of visual data from surveys in underdeveloped regions of Brazil, mask wearing rates are also positively correlated with education and income, according to the same surveys. Therefore, it is reasonable to assume that mask wearing rates would be lower in underdeveloped areas such as slums, which have not yet been heavily enumerated, where education is lacking and healthcare funding is unregulated.

6) Japan

a) Health policies: The Government of Japan has been adopting a more proactive anti-pandemic policy in terms of governance. Japanese authorities have taken proactive measures, including declaring a state of emergency on 16 April 2020, in the event of a large-scale infection in the country. The government restricted a variety of human behaviors, including regulating transnational/cross-border travel and mass gatherings, the temporary closure of all Japanese elementary, junior and senior high schools, and the implementation of telework modes. On 7 January 2021, Prime Minister Yoshihide Suga issued a "Declaration of Emergency", declaring a month-long state of emergency in the Tokyo metropolitan area and the three prefectures of Saitama, Chiba, and Kanagawa, beginning on 8 January. On 7 January, Prime Minister Kan issued a "Declaration of Emergency", declaring a one-month state of emergency in Tokyo, Saitama, Chiba, and Kanagawa prefectures from 8 January, which was extended to seven other prefectures on 13 January. And as early as March 2020, the Prime Minister of Japan advised the public to avoid the three Cs (confined spaces, crowded places, and close contact environments) to effectively curb the spread of the virus. Although the wearing of masks has never been made mandatory in Japan, the high level of public trust in the government has made the implementation of the policy more robust than in other countries.

b) Risk perceptions: The Japanese population has always been highly alert to the new coronavirus. In a statistical study on the national risk perception of COVID-19, Japan scored higher than 4.7 out of 7 (the higher the score, the higher the risk perception). According to YouGov, from June 2020 to mid-March 2021, the proportion of Japanese people who were afraid

of contracting a COVID-19 remained above 70% and fluctuated around 80% most of the time.

c) Risk preferences: According to Hofstede's cultural dimensions' theory, Japan is one of the most uncertainty-avoidant countries on the planet, and at the same time has many of the characteristics of a collectivist society, such as prioritising group harmony over the expression of individual opinions, and a strong sense of shame about losing face. This is often attributed to the fact that Japan is constantly threatened by natural disasters such as earthquakes, tsunamis (that's an internationally used Japanese word), typhoons and volcanic eruptions. Under these circumstances, the Japanese have learnt to be prepared for any uncertainty. This applies not only to emergency plans and precautions for sudden natural disasters, but also to all aspects of society. It has also been shown that social integration may be important in promoting the use of masks. It is also worth noting that in the case of Japan, the wearing of masks is actually a long-standing behavior. Firstly, after the war, Japan introduced cedar trees, which are cheap and have a short growth cycle, in order to improve the ecology and obtain raw materials. The large amount of pollen brought by cedar trees in spring caused hay fever to many Japanese people, and after the economic leap in the 1980s, Japan lost the demand for local timber materials and then preserved a large number of cedar trees for ornamental purposes, and the long-term presence of cedar pollen caused great inconvenience to the people's lives. For this reason, many people wear masks to alleviate the symptoms of hay fever. In addition, Japanese people believe that wearing masks has a practical function such as keeping warmth and moisture out and preventing bad breath. To a certain extent, wearing a mask symbolizes respect and courtesy to others in the society and culture, and it also gives a sense of security to people who are cautious in their interpersonal interactions.

d) Summary: It is due to these major factors that the mask-wearing rate among the Japanese population has remained high for a long time. Online research showed that even before the outbreak, more than 80 per cent of Japanese citizens were comfortable with wearing masks for a period of time in their daily lives, including 39 per cent who did not mind wearing masks all day. Meanwhile, an online survey conducted in the early stages of the outbreak showed that 70.1 per cent of the Japanese public were wearing masks at that stage to prevent a viral infection or outbreak. Since the early days of the C. neoformans outbreak, the majority of Japanese have embraced preventive behavioral change and adhered to the public health recommendations of wearing masks, hand hygiene and keeping a social distance. Behind the Japanese people's ability to maintain a very high rate of mask-wearing in the face of the NKP outbreak is a combination of government initiatives or advice, the Japanese people's own emphasis on unknown risks such as natural disasters, and a national cultural trait that tends to favor risk aversion. It is also worth mentioning that the social and cultural aspects of mask wearing in Japan are also an influential factor that cannot be ignored.

B. Factors influencing the public's behavior in wearing mask

In further analyses of the study, the paper finds that there are other underlying factors behind health policies and risk preferences. For example, health policies formulated in a country are sometimes not always fully implemented, which may be due to insufficient funding for healthcare as a result of socio-economic backwardness, or due to a socio-political system that results in a fragmentation of central and local health policies; and the public's risk appetite in a country is again often dictated by traditional socio-cultural determinants. Therefore, this paper has refined the model's influences by listing higher-level influences, namely, "government governance" and "sociocultural". The PPP model of the factors influencing the public's behavior in wearing masks is as follows:

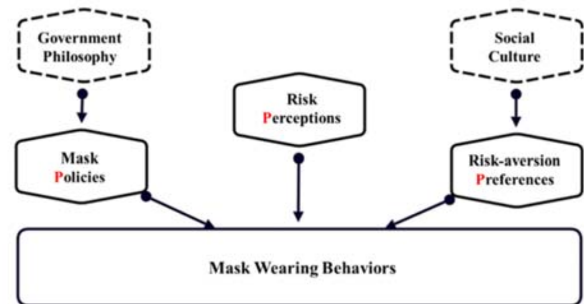

Fig. 1. “PPP Model” of factors influencing the public's behavior in wearing masks

IV. Discussions

A study by McCaffery KJ et al. exploring population health literacy during the 2020 phase III lockdown of the Australian neo-crown pandemic[7] showed significant differences in knowledge, coping attitudes and health behaviors related to the neo-crown virus. This has the potential to undermine efforts to reduce the spread of the virus and may lead to social inequalities in health outcomes in Australia. Another cross-sectional study conducted by Jepson M et al in the Australian community[8] suggests that susceptible people in some communities and those who ignore the hazards of neo-crown are more in need of some effective access to public health information for information acquisition or guidance. Therefore, when we carry out prevention and treatment at the grassroots level, in addition to the control function of the government, we should also raise the level of risk awareness of the residents themselves through education and popularization of science, so as to mobilize the community to respond to public health events in accordance with science.

During the pandemic, the federal government led by President Bolsonaro, as collated by Ferrante L et al, pursued a series of initiatives that would have exacerbated the spread of the pandemic, such as Bolsonaro's preaching of the ineffectiveness of social distancing measures, his public encouragement to refrain from wearing face masks, and his justification of the resumption of normal economic activity, all of which chose to disregard the lives and health of Brazilian nationals for the sake of economic recovery[9][10]. In the results section, there is also a description of the contradictory situation between central and local policies on epidemiological protection in both Brazil and India. It is clear that both central leadership

and local implementation of policies are indispensable for governments that want to protect the lives and health of their citizens. The right way to protect the lives and health of citizens is for the state to focus its efforts on the implementation of proactive policies that are appropriate to the national context, and at the same time to ensure that the policies are implemented as far as possible.

This study has several limitations. Firstly, as there are fewer studies on the public's mask-wearing behavior, and the research team in this paper is unable to obtain primary data due to various constraints, only a small amount of secondary data that meets the requirements can be selected, and it may not be able to cover the full range of time periods. Secondly, it is difficult to quantify and compare socio-cultural risk preferences, so this paper can only make a general distinction.

In this paper, through the narrative study of public mask-wearing behavior in six countries, namely Germany, the United States, India, South Africa, Brazil, and Japan, we find three factors influencing the public's mask-wearing behavior: health policy, risk perception, and risk preference, and explore the influence of governmental governance behind the health policy as well as the socio-cultural influences behind the risk preference, so as to construct a corresponding analytical model of the factors influencing the public's mask-wearing behavior. This paper provides a theoretical basis for cross-cultural research on public mask-wearing behavior, which can help different countries to formulate and implement public health measures more accurately and efficiently in the face of public health events.

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